

Serial No. 09/434,161

Corrected Response to Office Action Mailed July 30, 2003
December 22, 2003**AMENDMENT TO THE CLAIMS**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

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1-2 (Cancelled).

3 (Original). A method of recording input packets on a storage medium comprising the steps of:

generating arrival time control clocks in synchronism with changes in value of time stamps for arrival time identification added to the input packets;

forming tracks on the storage medium in sequence in response to reference control signals provided in synchronism with said arrival time control clocks; and

recording the packets with the time stamps on the storage medium in order of arrivals of the packets so that each of the packets is recorded within a given area ranging from a reference position defined on one of the tracks corresponding to an arrival time of each of the packets to a given position away from the reference position at a preselected distance toward the following track.

4 (Original). A method of recording input packets on a storage medium as set forth in claim 3, wherein said recording step expands the packets in time to record them on the storage medium.

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5-13 (Cancelled).

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14 (Currently Amended). A method of recording and reproducing packets with time stamps for arrival time identification recorded on tracks formed in time sequence on a storage medium comprising the steps of:

generating arrival time control clocks in synchronism with changes in value of time stamps for arrival time identification added to the input packets;

forming tracks on the storage medium in sequence in response to reference control signals provided in synchronism with said arrival time control clocks;

recording the packets with the time stamps on the storage medium in order of arrivals of the packets so that each of the packets is recorded within a given area ranging from a reference position defined on one of the tracks corresponding to an arrival time of each of the packets to a given position away from the reference position at a preselected distance toward the following track;

reproducing the packets from the storage medium;

generating output time control clocks which correspond to positions of the tracks formed on the storage medium and which undergo delays of preselected time corresponding to a given area on the tracks formed in time sequence on the storage medium; and

outputting the packets with timing determined by the time stamps on a basis of the output time control clocks.

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15 (Original). A method as set forth in claim 14, wherein each of the delays of preselected time corresponds to a time interval of one track.

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16 (Currently Amended). A method of recording and reproducing packets with time stamps for arrival time identification recorded on tracks formed in time sequence on a storage medium comprising the steps of:

generating arrival time control clocks in synchronism with changes in value of time stamps for arrival time identification added to the input packets;

forming tracks on the storage medium in sequence in response to reference control signals provided in synchronism with said arrival time control clocks;

recording the packets with the time stamps on the storage medium in order of arrivals of the packets so that each of the packets is recorded within a given area ranging from a reference position defined on one of the tracks corresponding to an arrival time of each of the packets to a given position away from the reference position at a preselected distance toward the following track;

reproducing the packets and the time stamps from the storage medium;

generating output time control clocks whose initial value is determined by one of the time stamps; and

outputting the packets at time intervals determined by the time stamps on a basis of the output time control clocks.

17-19 (Cancelled).

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20 (Original). A packet recording apparatus for recording input packets on a storage medium comprising:

clock generating means for generating arrival time control clocks which are synchronous with values of time stamps added to the input packets;

recording means for recording tracks on the storage medium in time sequence to record the packets to which said time stamps are added on the storage medium in order of arrivals of the packets so that each of the packets is recorded within a given area ranging from a reference position defined on one of the tracks corresponding to an arrival (tune) of each of the packets to a given position away from the reference position at a preselected distance toward the following track; and

controlling means for controlling positions of the tracks formed on the storage medium in synchronism with said arrival time control clocks.

21 (Original). A packet recording apparatus as set forth in claim 20, wherein said reference position is a record-starting position defined on the one of the tracks.

22 (Original). A packet recording apparatus for recording input packets on a storage medium comprising:

clock generating means for generating arrival time control clocks which are synchronous with values of time stamps added to the input packets;

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recording means for recording tracks on the storage medium in time sequence to record the packets to which the time stamps are added on the storage medium in order of arrivals of the packets so that each of the packets is recorded within a given area ranging from a first position to a second position across a reference position, the reference position being defined on one of the tracks corresponding to an arrival time of each of the packets, the first and second positions being defined away from the reference position at preselected distances toward the tracks preceding and following the one of the tracks, respectively; and

controlling means for controlling positions of the tracks formed on the storage medium in synchronism with said arrival time control clocks.

23 (Currently Amended). A packet recording and reproducing apparatus comprising:

clock generating means for generating arrival time control clocks which are synchronous with values of time stamps added to the input packets;

recording means for recording tracks on the storage medium in time sequence to record the packets to which said time stamps are added on the storage medium in order of arrivals of the packets so that each of the packets is recorded within a given area ranging from a reference position defined on one of the tracks corresponding to an arrival time of each of the packets to a given position away from the reference position at a preselected distance toward the following track;

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controlling means for controlling positions of the tracks formed on the storage medium in synchronism with said arrival time control clocks;

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reproducing means for reproducing tracks formed in time sequence on a storage medium to reproduce packets, to which time stamps for arrival time identification are added, recorded on the tracks;

clock generating means for generating clocks having a given frequency;

track control means for controlling positions where the tracks are reproduced by said reproducing means in synchronism with said clocks;

output control clock generating means for generating output control clocks after a delay of given time from said clocks generated by said clock generating means, respectively;

comparing means comparing a value changed in synchronism with said output control clocks with one of the time stamps to provide a signal when said value coincides with said one of the time stamps; and

outputting means for outputting one of the packets to which said one of the time stamps is added.

24 (Currently Amended). A packet recording and reproducing apparatus as set forth in claim 23, further comprising time stamp removing means for removing the time stamp from said one of the packets outputted from said outputting means.

25-27 (Cancelled).

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28 (Currently Amended). A digital broadcasting receiver comprising:

demodulating means for demodulating digital broadcasting signals including packets of information on a plurality of programs and time control packets each including time control information on one of the programs to provide demodulated signals;

selecting means for selecting the packets of at least one of the programs from the demodulated signals from said demodulating means;

identification information producing means for producing identification information serving to identify the time control packet from the packets selected by said selecting means, said identification information producing means outputting the identification information along with the packets selected by said selecting means,

said identification information producing means further operating for adding a predetermined time-control-information-identification flag to the time control packet; and

decoding means for decoding the packets outputted from said identification information producing means based on the identification information.

29 (Currently Amended). A digital broadcasting receiver as set forth in claim 28, wherein said identification information is formed by said identification information producing means to have said ~~with a time control information identification~~ time-control-information-identification flag ~~which is added by said identification information producing means~~ to a header of the time control packet.

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30 (Original). A digital broadcasting receiver as set forth in claim 28, wherein said identification information producing means provides packet identifying numbers for identifying the time control packets in a given manner.

31 (Original). A digital broadcasting receiver as set forth in claim 30, wherein when said selecting means selects the packets of two or more of the programs and when the packet identifying numbers of the time control packets of the two or more selected programs are different from each other, said identification information producing means produces the identification information serving to identify the time control packet specified by given one of the packet identifying numbers.

32 (Original). A digital broadcasting receiver as set forth in claim 29, wherein the digital signals are formed with transport packets having program specific information of MPEG2, and wherein said time control information is provided by a program clock reference.

33-37 (Cancelled).

38 (Original). A packet recording apparatus comprising:

arrival time control clock generating means for generating arrival time control clocks in synchronism with input of a time reference value added to input packets;

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arrival time identification reference value generating means for generating arrival time identification reference values in synchronism with the arrival time control clocks generated by said arrival time control clock generating means;

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synchronization determining means for determining whether the arrival time control clocks are synchronous with the input of the time reference value or not, said synchronization determining means providing a first signal when the arrival time control clocks are synchronous with the input of the time reference value and a second signal when the arrival time control clocks are asynchronous with the input of the time reference value;

adding means for adding the arrival time identification reference values to the input packets:

switching means for switching between a first operation and a second operation, the first operation being provided in response to the first signal from said synchronization determining means to allow operations of said arrival time control clock generating means and said adding means, the second operation being provided in response to the second signal from said synchronization determining means to inhibit the operation of said arrival time control clock generating means; and

recording means for recording the packets to which the arrival time identification reference values are added by said adding means on a storage medium.

39 (Original). A packet recording apparatus as set forth in claim 38, wherein said arrival time control clock generating means includes an extracting circuit which extracts

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the time reference value from the packets and a feedback loop comparing a count value provided by a counter based on the time reference value with the time reference value to determine a difference therebetween to control a frequency of oscillations provided by an oscillator according to said difference to output the oscillations as said arrival time control clocks and to feedback the oscillations to the counter as being used as the time reference value in following cycles, and wherein said synchronization determining means includes an averaging circuit which averages the differences derived by arrival time control clock generating means for given number of cycles and a comparing circuit which compares an output signal from said averaging means with a given reference value to provide the first and second signals based on a result of the comparison.

40 (Original). A packet recording apparatus comprising:

arrival time control clock generating means for generating arrival time control clocks in synchronism with input of a time reference value added to input packets;

arrival time identification reference value generating means for generating arrival time identification reference values in synchronism with the arrival time control clocks generated by said arrival time control clock generating means;

lock flag producing means for producing a lock flag indicative of a synchronization condition of said arrival time control clock generating means a preselected period of time after a first one of the packets is inputted to said arrival time control clock generating means;

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adding means for adding the lock flag along with the arrival time identification reference values to the input packets; and

recording means for recording the packets to which the arrival time identification reference values are added by said adding means on a storage medium.

41 (Original). A packet recording apparatus comprising:

arrival time control clock generating means for generating arrival time control clocks in synchronism with input of a time reference value added to input packets;

arrival time identification reference value generating means for generating arrival time identification reference values in synchronism with the arrival time control clocks generated by said arrival time control clock generating means;

synchronization determining means for determining whether the arrival time control clocks are synchronous with the input of the time reference value or not, said synchronization determining means providing a first signal when the arrival time control clocks are synchronous with the input of the time reference value and a second signal when the arrival time control clocks are asynchronous with the input of the time reference value;

adding means for adding the arrival time identification reference values to the input packets;

recording means for recording the packets to which the arrival time identification reference values are added by said adding means on a storage medium; and

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controlling means for controlling an operation of said recording means, said controlling means supplying the packets to said adding means at all times, activating the operation of said recording means in response to the first signal from said synchronization determining means, and deactivating the operation of said recording means in response to the second signal from said synchronization determining means.

42 (Original). A packet recording apparatus as set forth in claim 38, wherein said packets are transmitted by digital signals carrying one or more programs and said time reference value added to one of said packets.

43 (Original). A packet recording apparatus as set forth in claim 40, wherein said packets are transmitted by digital signals carrying one or more programs and said time reference value added to one of said packets.

44 (Original). A packet recording apparatus as set forth in claim 41, wherein said packets are transmitted by digital signals carrying one or more programs and said time reference value added to one of said packets.